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ABSTRACT

This set of teacher-developed instructional units is intended for use in secondary-level vocational agriculture courses dealing with landscape and nursery management courses. The following topics are covered in the individual units: identification of landscape plants, selection of landscape plants, understanding soils and fertilizers, water management and irrigation, techniques for developing and drawing landscape plans, procedures for pruning and training ornamental trees, methods of transplanting trees and shrubs, insect and disease identification, house plant care and production, containers and structures, care of mature trees, horticultural mechanics, pesticide use and safety, retail horticulture skills, retail sales and appropriate attitudes, and steps in establishing wildlife habitats. Each unit includes a title page, teaching outline, and learning activities. The title page includes the unit title, unit goal, and unit performance objectives. The teaching outline describes the unit in terms of the information, skills, and knowledge that should be presented. The learning activities list in each unit provides recommended or suggested activities and procedures for presenting them. (MN)

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UNITS OF INSTRUCTION IN LANDSCAPE AND NURSERY MANAGEMENT

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FORWARD

This collection of instructional units in landscape and nursery management represents the efforts of sixteen Iowa high school vocational agriculture instructors who enrolled in a two and one-half day curriculum workshop in June, 1987, offered through the Agricultural Education Department at Iowa State University, Ames, Iowa 50011. The selection of instructional topics included in this landscape and nursery management curriculum reflects only those topical areas which the instructors felt would be appropriate for inclusion in their programs.

Each of the units is organized into three parts: the title page; a teaching outline; and learning activities. The title page consists of the unit title, unit goal, and the unit performance objectives. The teaching outline describes the unit in terms of information, skills, and knowledge that should be presented by the instructor to the student learner. The third part of each unit is the learning activities list which includes recommended or suggested activities which will will enhance the learning processes of the students.

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COURSE: Nursery and Landscape Management

UNIT TITLE: Careers

UNIT GOAL: To provide students with information and facts about careers that can be obtained through a systematic career ladder.

UNIT PERFORMANCE OBJECTIVE:

Upon completion of this instructional unit, the student will be able to:

1. List jobs related to Nursery and Landscape Management.
2. Identify the amount of education they will need for those jobs.
3. Perform competencies that will enhance their quest for employment.
4. List and perform desirable human relation skills.

INSTRUCTOR'S NAME: Patrick Powers

TEACHING OUTLINE

I. Introduction to careers
   A. History of business
   B. List area occupations

II. Definition of career areas
   A. Pros and cons of career ladder
   B. Entry level occupation
   C. Foreman supervisor
   D. Assistant manager
   E. Manager or owner

III. Occupational requirements
   A. Positive attitude
   B. Willingness to learn
   C. Ability to accept criticism
   D. Excellent work ethic

IV. Skills requirement
   A. Communication with customer
   B. Operate equipment safely
   C. General knowledge of nursery-landscape field

V. Working conditions
   A. Physical labor
   B. Salesmanship
   C. Long hours
   D. Stocking selves

VI. Employment procedure
   A. Prepare letter of application
   B. Create resume'
   C. Perform an interview
   D. Write a follow-up letter

LEARNING ACTIVITIES

1. Survey community for occupational resources.
2. Student interviews resource person live or on phone.
3. Demonstrate phone skills.
4. Calibrate spray and fertilizer.
5. Hand and power tool identification.
6. Pest and insect identification
7. Employment video tapes
8. Field trips to business or community
9. Practice sales
10. Create resume'
11. Practice interviews
12. Students list proper human relation skills.
13. Resource people speak to whole class.
14. Cash register operations.

COURSE: Nursery and Landscape Management

UNIT TITLE: Identification of Landscape Plants

UNIT GOALS: Students will be able to identify common landscaping plants in the community, area and state.

UNIT PERFORMANCE OBJECTIVES:

Upon completion of this instructional unit, the student will be able to:

1. Identify plants both up close and at a distance when identifying them.
2. Classify plants in the following groups: deciduous trees, deciduous shrubs, evergreen trees, evergreen shrubs, vines, ground cover, ferns and flowers.
3. Identify basic plant forms such as upright, spreading, mounding, pyramidal, columnar, arching and trailing.
4. Use plant physical characteristics such as leaves, stems, buds, flowers, fruit, size and form for identification.
5. Identify 25 trees and shrubs in the community.

INSTRUCTOR'S NAME: Brad Greiman

TEACHING OUTLINE

I. Classification of plants into general groups
   - A. Deciduous
     1. Trees
     2. Shrubs
   - B. Evergreens
     1. Trees
     2. Shrubs
   - C. Vines
   - D. Ground covers
   - E. Ferns
   - F. Flowers

II. Classification of plants by form
   - A. Upright
   - B. Spreading
   - C. Mounding
   - D. Pyramidal
   - E. Columnar
   - F. Arching
   - G. Trailing

III. Differences of physical characteristics
   - A. Leaves
   - B. Stems
   - C. Buds
   - D. Flowers
   - E. Fruit
   - F. Size
   - G. Form

LEARNING ACTIVITIES

1. Mount a collection of plants and plant parts.
2. Cut out pictures of plants from magazines and nursery catalogs to make flash cards.
3. Conduct a scavenger hunt for plants. Use the samples for a quiz.
4. Identify plants at the local nursery, school, park and etc.
5. Develop an arboretum in the community.
6. Draw a map of the school grounds and identify all plants.
7. Each student should identify all plants at their home, acreage, or farm.
8. Develop a slide show on different plants.

COURSE: Nursery and Landscape Management

UNIT TITLE: Selection of Landscape Plants

UNIT GOAL: Upon completion of this unit, the student will be able to identify and explain the use of trees, shrubs and ground covers.

UNIT PERFORMANCE OBJECTIVE:

1. Identify 6 basic tree shapes and give examples of each one.
2. Explain the use of large trees and small trees.
3. Identify shrubs that are best used for accent borders, hedges and screens, foundations and specimens.
4. Identify 6 ground covers on sight.
5. Categorize a vine on sight.

INSTRUCTOR'S NAME: Darwin Campbell

TEACHING OUTLINE

I. Basic shapes of trees
   A. List the six shapes of trees.
   B. Discuss how different shapes could accenuate features.
   C. Identify species of plants to show differences in shape.

II. Large trees
   A. Discuss uses of large trees.
   B. Identify large trees used in landscaping.
   C. List advantages and disadvantages of larger trees.
   D. Distinguish between large deciduous and evergreen trees.
   E. Identify different plant species.

III. Small trees
   A. Discuss uses for small trees.
   B. Identify small trees used for landscaping.
   C. List advantages and disadvantages of small trees.
   D. Distinguish between deciduous and evergreen trees.
   E. Identify different species.

IV. Accent shrubs
   A. Selection of shrubs for dished effects, ie. privacy, added interest, etc.
   B. Location of shrubs for desired effects for species.
   C. Identify different species of shrubs.

V. Ground covers
   A. Identify different types of ground covers.
   B. List reasons for using ground covers.
   C. Discuss the growing habits for various ground covers.

VI. Selection of plants
   A. Select plants that are hardy for your area.
   B. Select plants needed for desired height and spread.
   C. Select plants for desired characteristics (ie. color, fruit, season).

LEARNING ACTIVITIES

1. Send groups of students out to determine the ornamentals used in landscaping the school grounds.

2. Visit local nursery to identify several different ornamental trees, shrubs and ground covers.

3. Go on a field trip in town and identify houses that have had the proper selection of ornamentals.

4. Consult several different catalogs and identify their recommendations for planting and hardiness zone.

5. Visit local landscape businesses and parks to observe that several different plants are used to achieve several different effects.

6. Draw landscape plans and select trees, shrubs and ground cover to be planted and list reasons for selections.

7. At local nursery, select plants that could be evaluated and judged.

8. Have students memorize plant flower colors,

9. Show films and tapes on basic plant selection.

10. Invite guest speaker to talk on plant selection.

11. Have students memorize different types of trees and shrubs native to your area.

COURSE: Nursery and Landscape Management

UNIT TITLE: Understanding Soils and Fertilizers

UNIT GOAL: To develop a student's ability to identify different soil types and textures, select and apply fertilizers and growth stimulants correctly and safely.

UNIT PERFORMANCE OBJECTIVES:

Upon completion of this instructional unit, the student will be able to:

1. Demonstrate the ability to identify various soil textures.
2. Demonstrate the ability to identify various sizes of soil particles.
3. Explain the importance of organic matter and how it determines the value of a soil.
4. Understand methods used to determine soil pH.
5. Demonstrate a knowledge of fertilizers and their use.
6. Demonstrate a knowledge of growth stimulants and hormones.
7. Mix various organic materials and soil for plants.

INSTRUCTOR'S NAME: Dennis Steele

TEACHING OUTLINES

A. Identify various sizes of soil particles
   1. Show filmstrip Soil and Soil Properties, from IVATA Educational Packet
   2. Identify the three soil separates
   3. List properties of soil separates
   4. Show how to separate soil separates

B. Identify different soil textures
   1. Explain soil texture and structure
   2. Introduce students to the "Ribbon Method" of estimating soil texture
   3. Explain the soil textural triangle
   4. State the characteristics of the different soil textures and colors

C. Importance of organic matter in a soil
   1. Define organic and inorganic
   2. Discuss advantages of organic soils
   3. Show samples of different organic matter and soils with various organic matter levels

D. The importance of soil pH
   1. Define and explain pH scale
   2. Discuss problems associated with improper pH
   3. Demonstrate use of pH meter and other pH tests
   4. Explain how to adjust pH

E. Fertilizers
   1. Explain primary and trace elements
   2. Identify function of plant food elements
   3. Explain physical forms and formulations of fertilizers
   4. Test for soil nutrients
   5. Discuss application rates and methods

F. Growth stimulants, retardants, and hormones
   1. Explain and show uses of stimulants - retardants and hormones
   2. Explain importance of following label instructions

G. Preparing soil mixes for plants
   1. Study various materials to mix soil for plants
   2. Learn proportions of materials for various plants
   3. Demonstrate mixing procedure

LEARNING ACTIVITIES

A. The student will:
   1. Identify the 3 soil separates according to size.
   2. Conduct experiment to determine which soil separate holds the most water.

B. The student will:
   1. Use the ribbon method and soil triangle to determine texture of various soils.
   2. Locate different soil horizons in a profile.
   3. Local various soil types from a soils map.

C. The student will:
   1. List 3 inorganic and 6 organic materials found in the soil.
   2. List 5 benefits of organic matter in soils.
   3. Explain how organic matter is changed to humus.

D. The student will:
   1. Demonstrate an understanding of PH and the PH scale.
   2. List suitable PH levels for various horticultural plants.
   3. Discuss problems related to improper PH levels.
   4. Demonstrate use of PH meter and other PH testing methods.
   5. Explain how to adjust PH.

E. The student will:
   1. List the primary and secondary plant nutrients and functions of each.
   2. Take soil samples and analyze.
   3. Compose balanced fertilizers for specific trees and shrubs.
   4. Understand fertiliizer labels and directions for application.
   5. Fertilize trees around school grounds.

F. The student will:
   1. Recommend stimulants, retardants and hormones for specific conditions.
   2. Mix and apply these materials to bedding plants.
   3. Compare treated and non-treated plants in lab.

G. The student will:
   1. List and identify materials to use in mixing soil base.
   2. Match different mixtures to specific plants.
   3. Mix and pot soils for various plants in the lab.

COURSE: Nursery & Landscape Management

UNIT TITLE: Water Management and Irrigation

UNIT GOAL: Become familiar with, recommend, and properly demonstrate water management and irrigation systems available for nursery/landscape/turf/gardens.

UNIT PERFORMANCE OBJECTIVES:

Upon completion of this instructional unit, the student will be able to:

1. Describe 4 types of watering systems.
2. Identify 15 watering system fixtures, controls, devices, etc.
3. Demonstrate proper garden hose, plastic, copper and galvanized pipe, plumbing connections and repairs.
4. Calculate water flow, application rates and cost of watering systems.
5. Identify 6 types of mulching materials for water management.
6. Plan a water management system for a nursery/landscape/turf/garden area.
7. Demonstrate proper watering of a planted tree/lawn.

INSTRUCTOR'S NAME: Russ Johnson

TEACHING OUTLINE

I. Introduce types of water management systems
   A. Hand Watering - types
   B. Sprinklers - types
   C. Trickle Irrigation - types
   D. Irrigation - types
   E. Tubes and Capillary Mats - types
   F. Mist
   G. Mulches - types

II. Importance of Water, Function, Requirements (Inches vs. Gallons), and Application (1" minimum/application) Rates and Times
   A. Do math calculations
   B. Lab work with water flow and rates

III. Watering fixtures, devices, controls, etc.
   A. Identify from samples and catalogs
   B. Lab - do plumbing work
   C. Lab - construct an automated system

IV. Mulching materials and uses
   A. Identification
   B. Lab - place mulching materials on landscaping area

V. Plan a water management system for a problem area

Learning Activities

1. Field trip - observe irrigation system in operation at greenhouse, nursery, lawn, garden, field, and etc.

2. Using Catalogs, student will (a) identify materials, fixtures, controls, and devices, (b) costs, (c) recommendations.

3. Lab - calculate flow rate from hose.

4. Lab - calculate and compare application rataes and patterns from 3 types of sprinklers and 2 types of trickle systems.

5. Lab - students make (a) garden hose repairs, (b) glue plastic pipe connections, (c) solder cooper tubing, (d) cut threads on steel pipe.

6. Lab - student will install an automated control device on a watering system.

7. Student use a soil moisture meter in soil.

8. Student apply straw, wood chips, plastic materials in a landscape project area.

9. Student design a complete water management system for a landscape or garden area.

10. Class set up a demonstration plot to show the effect of watering frequency and rate.

11. Class install a trickle irrigation system in a local garden.

12. Class mulch part of a local garden.

13. Class compare use of city water vs. well vs. rainwater on plant growth (should be no effect).

14. Students calculate flow rates from various diameter and length of hoses.

15. Students calculate cost to draw irrigation water from pond or creek to area needed.

COURSE: Nursery and Landscape

UNIT TITLE: Developing and Drawing Landscape Plans

UNIT GOAL: Students will have an understanding of the components necessary for drawing a landscape plan.

UNIT PERFORMANCE OBJECTIVES:

Upon completion of this instructional unit, the student will be able to:

1. Use basic tools needed to draw a landscape plan (includes metric ruler, graph paper, protractor, etc.).
2. Identify basic materials needed for landscape design.
3. Determine prices and costs of materials for landscaping.
4. Design a landscape plan.
5. Design a year to year landscape plan using map skills and prices.

INSTRUCTOR'S NAME: Milt Luckstead, Jr.

TEACHING OUTLINE

I. Using basic tools
   - A. Metric ruler
   - B. Protractor
   - C. Graph paper
   - D. Other

II. Identify basic materials
   - A. Deciduous trees
   - B. Deciduous shrubs
   - C. Evergreen trees
   - D. Evergreen shrubs
   - E. Vines
   - F. Ground cover
   - G. Flowers
   - H. Brick
   - I. Railroad ties
   - J. Landscaping timbers
   - K. Concrete
   - L. Stone
   - M. Mulches
   - N. Native grasses

III. Determine prices of materials
   - A. Buying wholesale
   - B. Buying from a nursery
   - C. Starting plants

IV. Map out a landscape plan
   - A. Scale drawing
   - B. Using a landscape key
   - C. Identifying existing structures

V. Planning a year to year plan
   - A. Using a yearly budget
   - B. Identifying exisiting structures
   - C. Identifying proposed structures

LEARNING ACTIVITIES

1. Field trip to local nursery that designs landscape.
2. Matching exercise with identification of materials.
3. Students draw a landscape plan.
4. Students plan a 3-5 year landscape plan and costs.
6. MRC videotape on Selecting and Planting Nursery Landscape Plants.
7. Use Nursery/Landscape Plant Identification Cards from University of Illinois at Urbana Champaign.
8. PM 212 Landscape Plants for Iowa, ISU Extension Service.
9. PM 612 Homegrounds Planning Worksheet, ISU Extension Service.
10. Landscaping Your Home, student manual and teachers manual.
11. Fundamentals of Landscaping and Site Planning by Jones B. Root as a reference.
12. Having a judging contest with plant materials, give ribbons as prizes.
13. Have a contest with landscape drawing, the winning person receiving a pocket knife.

COURSE: Nursery and Landscape Management

UNIT TITLE: Pruning and Training Ornamental Trees

UNIT GOAL: After completing this unit the student will be able to effectively train and prune ornamental trees safely.

UNIT PERFORMANCE:

Upon completion of this instructional unit, the student will be able to:

1. Properly and safely use and identify all tools used in pruning ornamentals.

2. List the reasons for pruning ornamentals.

3. Identify different training methods used in ornamental and fruit trees.

4. Properly stake young trees using a single stake, double stakes, and three guy wire.

5. Identify parts of a tree such as: terminal shoot; bud; leader v-crotches; scaffold or lateral branches; and water sprouts.

6. Identify large branches that need pruning and correctly use a 3-cut method for removal.

INSTRUCTOR'S NAME: Steve Olson

TEACHING OUTLINE

I. Introduction to pruning and training of ornamental trees
   A. Show need for pruning and training
   B. Identify the parts of a tree
   C. Learn what to look for in a good tree
   D. Parts of tree or branches that need to be pruned or removed.

II. Tools used in pruning
   A. Identify tools used in pruning
   B. Demonstrate correct procedure for using tools
   C. Practice pruning using different tools
      1. Identify types of wound dressings to be used

III. Methods for training fruit trees
   A. Central leader
   B. Open center
   C. Modified central leader

IV. Methods of staking young trees
   A. Single stake
   B. Double stake
   C. Three-guy wire

V. Alternate methods for training ornamentals
   A. Wires
   B. Weights
   C. Staking

LEARNING ACTIVITIES

1. Display and identify the tools used in pruning. Identify the following: hand-pruning shears, lopping shears, hedge shears, pruning saw, antiseptic tree dressing, pruning paint, dressing wax.

2. Go out to a park, community, etc. and identify trees and branches to prune.

   - use tape or string to identify branches to prune
   - after inspection and approval by instructor have students prune
   - dress wounds (if needed)
   - students could also practice which limbs to prune by x-ing out limbs on a handout with problem trees

3. Go out in a community and identify the 3 methods of training fruit trees.

   - central leader
   - open center
   - modified center leader

4. Make a photo display in the classroom of before and after shots of trees pruned.

5. Practice staking young trees using: single stake, double stake, three guy wire

6. Practice using the 3 cut method for removal of large branches.

7. Construct a tree on a display board that has problems. Example - watersprouts, crossed limbs, multiple leaders, vertical up or down branches, diseased limbs, etc.

COURSE: Nursery and Landscape Management

UNIT TITLE: Transplanting Trees and Shrubs

UNIT GOAL: The goal of this unit is to provide the student with the proper steps for transplanting trees or shrubs in a landscape design.

UNIT PERFORMANCE OBJECTIVES:

Upon completion of this instructional unit, the student will be able to:

1. Identify the equipment necessary to transplant a tree or shrub.
2. Describe the difference between bare root, balled and burlapped, and containerized plantings.
3. Explain the application of a commerical tree spade.
4. List the steps to be followed in properly transplanting a tree or shrub.
5. Demonstrate the proper transplanting of a tree or shrub.

INTRUCTOR'S NAME: Larry Vold

TEACHING OUTLINE

I. Introduction to transplanting
   A. Definition of transplanting
   B. Review of tree and shrub terminology
   C. Explanation of materials and equipment to be used

II. Understanding different transplanting practices
   A. Bare-root stock
   B. Balled-and-burlapped stock
   C. Containerized stock
      1. Plastic containers
      2. Paper or cardboard containers
   D. Commercial tree spade operations

III. Actual transplanting procedures
   A. Care of the purchased shrub or tree before transplanting
   B. Preparation of the site - digging depth and diameter
   C. Root pruning, fertilization and water
   D. Back-filling the hole
   E. Applying an appropriate mulch
   F. Staking or initial pruning
   G. Clean up and beginning care schedule (Watering trench)

IV. Application of transplanting procedures
   A. Observation of a tree or shrub transplanting
   B. Demonstration of a tree or shrub transplanting

SUGGESTED LEARNING ACTIVITIES

1. Brainstorm with the students all the steps thought to be necessary in transplanting shrubs and/or trees. Compile this list and check for accuracy at the conclusion of the unit.

2. Distribute PM 496 Tree Planting in Iowa (obtained from ISU Publications) and have students read. Follow up with a short quiz.

3. Contact a local nurseryman for samples of bare-root, balled-and-burlapped, and container stock specimens. Display these in the classroom laboratory and explain the differences.

4. Arrange for a field trip to a local landscaping project where a commerical tree spade can be observed in operation.

5. Assign each student to plant a shrub or tree in an appropriate location on the school grounds, working cooperatively with the school maintenance staff for equipment and a local greenhouse and/or nursery for stock. (Contact the newspaper reporter for a photo for good public relations).

6. View the video tape entitled "Selecting and Planting Landscape Plants" produced by ISU Extension Horticulturalist Jim Midcap and available through ISU Media Library.

COURSE: Nursery and Landscape Management

UNIT TITLE: Insect and Disease Identification

UNIT GOAL: Students will understand the insects and diseases of ornamental trees and shrubs.

UNIT PERFORMANCE OBJECTIVES:

Upon completion of this instructional unit, the student will be able to:

1. Describe insects that attack trees and ornamentals.
2. Describe diseases that attack trees and ornamental shrubs.
3. Recognize symptoms of diseases in trees and shrubs and diagnose the problem.
4. Recognize symptoms of insects in trees and shrubs and diagnose the problem.
5. Be able to troubleshoot the symptoms of diseases and insects.

INSTRUCTOR'S NAME: Ellen Doese

TEACHING OUTLINE

I. Introduction to insects and diseases of trees and shrubs.
   A. Purpose of studying unit
   B. Names of tree and shrub insects and diseases

II. Diseases of Evergreen trees and shrubs
   A. Disease of Evergreen trees
      1. Name
      2. Symptoms
      3. Host plants
   B. Disease of Evergreen shrub
      1. Name
      2. Symptoms
      3. Host plants

III. Diseases of Deciduous trees and shrubs
   A. Disease Deciduous trees
      1. Name
      2. Symptoms
      3. Host plants
   B. Disease Deciduous shrubs
      1. Names
      2. Symptoms
      3. Host plants

IV. Insects of Evergreen trees and shrubs
   A. Insects of Evergreen trees
      1. Names
      2. Symptoms
      3. Host plants

V. Insects of Deciduous trees and shrubs
   A. Insects of Deciduous trees
      1. Names
      2. Symptoms
      3. Host plants
   B. Insects of Deciduous shrubs
      1. Names
      2. Symptoms
      3. Host plants

VI. Troubleshooting Insects and Diseases
   A. Spotting situations environmentally controlled - lab
   B. Garden Center Scouting
   C. Commercial Scouting

LEARNING ACTIVITY

Introduction

1. Have students write for Extension Publication PM 463-3 = Common Tree and Shrub Pests from Iowa Publication.

2. Bring damaged plants and have students examine plants to determine 1) cause of problem, 2) treat existing problem, 3) how to prevent future problems.

3. Start a notebook of newspaper clippings about pests on landscape plants. The sunday newspaper garden section is a good place to start.

4. Have flashcards of insects and diseases to show the class.

5. Have students write for extension publications dealing with horticulture insects and diseases. These includes:

   PM 482: Controlling Oak Wilt
   PM 781: Diplodia Tip Blight
   PM 600: Dothistroma Needle Blight
   IC 413: Mimosa Webworm
   IC 414: Bagworm
   WL 46: Mouse Damage to Tree Plantings
   PM 909: Preventing Construction Damage to Trees
   WL 47: Rabbit Damage to Tree Plantings
   IC 415: Scale Insects and Their Control
   PM 256: Shade Tree Diseases - Anthracnose
   IC 417: Shade Trees Galls and Their Control
   IC 418: Spider Mites and Their Control

6. Diseases of Evergreen Trees and Shrubs/Decidious/Insects

   A. Visit a local greenhouse and have students study problems and make recommendations.
   B. Invite a nursery worker to talk on disease and insect problems of trees and shrubs.
   C. Have students do reports on diseases and insects.
   D. Maintain collection of infested trees and shrubs.
   E. Use flashcards of diseases and insects for students to be familiar with.
   F. Show the film from Modern Talking Pictures, "Insects and Science" and "Insects and Disease."
   G. Make a collection of pests and results of pests.
   H. Have students grow plants in different environments and determine the reasons why the plants behave in different ways.

7. Troubleshooting

A. Have students role-play as a customer and sales clerk in a commerical nursery. Have customers ask the sales clerk to identify various pests and pest damage.
B. Have plants infested that the students must determine the problem.
C. Provide a community service of identifying various pests in the local area for community residents.
D. Write newspaper articles to inform the public of insects and diseases.

COURSE: Nursery and Landscape Management

UNIT TITLE: House plant care and production

UNIT GOAL: The student will be able to care for typical house plants, diagnose specific plant disorders related to nutrition, disease and etc. and reproduce house plants.

UNIT PERFORMANCE OBJECTIVE:

Upon completion of this instructional unit, the student will be able to:

1. Care for various types of house plants in the home or floral shop.
2. Maintain proper environmental control in greenhouse or home.
3. Understand proper soil conditions and optimum use of fertilizer for production and maintenance.
4. Be able to identify insect pests of house plants.
5. Diagnose house plant problems caused by human error.
6. Select correct soil mixture for growing plants.

INSTRUCTOR'S NAME: Richard I. Fiddelke

TEACHING OUTLINE

I. Why house plant care?
   A. Become more urbanized
   B. Home owner's opportunity to enjoy plants has increased
   C. House plants and supplied have become more available.

II. House plants in the home
   A. Light intensity
      1. Different in home than nursery
      2. Variations in needs of different plants
      3. Know best location for particular house plants
   B. Humidity and nutritional needs
      1. Have way of checking humidity in home or office.
      2. Know the N-P-K and micro nutrient needs of various plants and how to apply it.

III. Diagnose house plant problems
   A. What is causing problems
      1. Man made
      2. Temperature
      3. Fertilizer
      4. Pests
   B. Correct pesticide recommendation
      1. Know what you are using
      2. Use correct rates
      3. ASK QUESTIONS

IV. Reproduction of house plants in lab
   A. Use plants from students
   B. Use different techniques
      1. Division method
         a. Use roots and devide to make several new plants.
      2. Stem cuttings
         a. Most common methods
         b. The easiest method for teaching
         c. Use correct rooting medium
      3. Leaf cuttings
         a. Similar to #2, but use leaf only
            Example - leaf of African Violet plant

V. Conclusion
   A. Importance of plants in home and office.
   B. The enjoyment and satisfaction of working and reproducing house plants.
   C. The necessary steps to have healthy plants.
   D. Where to go when you need expert advice.

LEARNING ACTIVITIES

1. Visit a commerical producer of house plants in your area.

2. Secure advice from local floral shop - have field trip.

3. Have a resource person discuss the importance of temperature, moisture, humidity in plant production and home environment.

4. Develop a plant care guide which can be given to students, teachers and community.

5. Set up display in school or community showing house plant problems and suggestions for remedies to these problems.

6. Have demonstration on the proper preparation of soil mixtures for specific plants.

7. Have students bring plants from home that could be used in propagation of new plants in the classroom.

8. Have students learn various ways of propagation ie. air layering, division of roots, stem cuttings, leaf cuttings and etc.

9. Have plant sale or give away class projects to friends and teachers.

COURSE: Nursery & Landscape Management

UNIT TITLE: Containers & Structures

UNIT GOAL: The students will have knowledge of containers and structures that can be used in plant propagation, transplanting, and growing and will be able to correctly identify, select, construct, and use containers and structures.

UNIT PERFORMANCE OBJECTIVES:

Upon completion of this instructional unit, the student will be able to:

1. List advantages and disadvantages of various containers and structures.
2. Identify suitable containers from home that could be used in plant propagation.
3. Identify suitable commercial containers for use in plant propagation.
4. Identify various plant protection structures.
5. Construct various plant protection structures.
6. Calculate cost of various containers and structures.

INSTRUCTOR'S NAME: Gaylan Scofield

TEACHING OUTLINE

I. Container Selection
   - A. Cost
   - B. Durability
   - C. Appearance
   - D. Insulation value
   - E. Shipping durability
   - F. Shape
   - G. Drainage & soil aeration
   - H. Size
   - I. Advantages & disadvantages

II. Seed Starting Containers
   - A. Containers From Home
     1. Paper
        - a. Milk Cartons
        - b. Cottage Cheese
        - c. Egg Cartons
     2. Plastic
        - a. Butter Tubs
        - b. Yogart Containers
     3. Styrofoam
        - a. Coffee Cups
        - b. Egg Cartons
     4. Glass
        - a. Jelly Jars
        - b. Cups
   - B. Commercial Containers/Aids
     1. Jiffy-7 Pellets
     2. BR8 Blocks
     3. KYS-Kube
     4. Fiber Pots, Trays, & Strips
     5. Styrofoam Pots & Trays
     6. Plastic Pots & Trays
     7. Heat Cables & Mats

III. Transplanting Containers
   - A. Flats
     1. Wood
     2. Plastic
   - B. Pots
     1. Clay
     2. Plastic
     3. Styrofoam

IV. Plant Protection Structures
   - A. Frost
     1. Hot Caps
     2. Plastic Covers & Sheets
     3. Water Tubes

4. Fiberglass Panels
5. Hotbeds
6. Cold Frames
7. Greenhouses

B. Animal & Insect
1. Wire Mesh
2. Plastic

C. Shade
1. Burlap
2. Cheesecloth
3. Commercial Sun Screen

LEARNING ACTIVITIES

I. Have students list factors to consider when selecting containers, both commercial and from the home.

II. Have students identify seed starting containers. Each student should bring two unique and unusual containers from home. This could be conducted as a contest. Each student should explain why they choose their particular containers. Finish this activity by planting seeds in the containers.

III. Have students identify various transplanting containers and aids. Students should correctly demonstrate the proper cleaning and preparation of the containers. Finish by transplanting seedlings into the containers.

IV. Have students construct and correctly explain or demonstrate the use of a plant protection structure. Things to be include are cost, availability of materials, advantages, disadvantages, etc..

COURSE: Nursery and Landscape Management

UNIT TITLE: Care of Mature Trees

UNIT GOAL: Upon completion of this unit, students will identify problem areas in caring for mature trees and find solutions for these problems.

UNIT PERFORMANCE OBJECTIVES:

Upon completion of this instructional unit, the student will be able to:

1. Identify wind damage to a tree and how to correct that problem.
2. Identify lightning damage and how to correct that problem.
3. Identify insect damage and possible solutions for that problem.
4. Identify disease damage and possible solutions.
5. Identify areas that might endanger the life of the tree.
6. Identify obstacles that may hinder the life of this tree and solutions for these obstacles.
7. Identify when to remove a tree.

INSTRUCTOR'S NAME: Scott Rix

TEACHING OUTLINE

I. Identification of mature trees
   A. Deciduous trees
   B. Evergreen trees

II. Identification of trees damaged by wind
   A. Broken limbs
   B. Damaged Bark
   C. Uprooted trees
   D. Correction of damage

III. Identification of trees damaged by lightning
   A. Correction of lightning

IV. Identification of insect damage
   A. Insects that attack mature deciduous trees
   B. Insects that attack mature evergreen trees
   C. Chemicals that could be used
   D. Other solutions

V. Identification of diseases of mature trees
   A. Diseases of mature deciduous trees
   B. Diseases of mature evergreen trees
   C. Solutions for these problems

VI. Identification of life threatening problems of mature trees
   A. Solutions for these problems

VII. Identification of obstacles that may hinder the tree
   A. Overhead wires and solutions
      1. Safety must be stressed
   B. Branches that may interfere with building

VIII. Identification of problems that may be relevant to your area
   A. Floods
   B. Fire
   C. Construction - root damage

IX. Identify those times when a tree may need to be removed
   A. Removal of trees
      1. Safety

LEARNING ACTIVITIES

1. Identify mature trees in your area.
2. Identify wind damaged trees.
3. Identify lightning damaged trees.
4. Identify disease damaged trees
5. Identify insect damaged trees
6. Field trips for all of the above.
7. Repair of trees
8. Cabling of trees
9. Removal of trees
10. Safety review of tools
11. Safety from falling branches
12. Safety of overhead power lines
13. Guest speakers
    A. Power line repair person
    B. County tree specialist

COURSE: Nursery and Landscape Management

UNIT TITLE: Horticultural Mechanics

UNIT GOAL: Students will have a basic understanding of horticultural mechanics and will be able to apply their skills to problem solving in the mechanics of horticulture.

UNIT PERFORMANCE OBJECTIVES:

Upon completion of this instructional unit, the student will be able to:

1. Identify machines used in horticultural careers.
2. List the basic principles of the our stroke engine.
3. Identify the basic principles of the two stroke engine.
4. Understand basic operation of electrical equipment.
5. Perform proper maintenance of equipment.
6. Safely operate a variety of small gas engine equipment.

INSTRUCTOR'S NAME: Jim Russ

TEACHING OUTLINE

I. Identify Machines
   - A. Push Mower
   - B. Riding Mower
   - C. Weed Eatter
   - D. Edger
   - E. Chainsaw
   - F. Sprayers
   - G. Hedge Trimmer
   - H. Garden Tillers

II. Basic principles of four stroke engine
   - A. Intake
   - B. Compression
   - C. Power
   - D. Exhaust

III. Basic principles of two stroke engine
   - A. Intake
   - B. Compression
   - C. Power
   - D. Exhaust

IV. Operation of electrical equipment
   - A. Basics of electrical motor
   - B. Reading a nameplate
   - C. Different types
   - D. Use of equipment

V. Proper maintenance of small engine equipment
   - A. Ignition System
   - B. Lubrication
   - C. Starter System
   - D. Fuels
   - E. Fuel Systems
   - F. Sharpening
   - G. Belts and Chains
   - H. Bump Head Care

VI. Safe operation of equipment
   - A. Use of shields
   - B. Proper clothing
   - C. Equipment Safety

LEARNING ACTIVITIES

1. Field trip to local business
2. Bring in assortment of equipment
3. Cross section of engines
4. Basic tear down
5. Stringing weed eater
6. Sharpen blades
7. Replace sparkplugs
8. Changing oil
9. Greasing
10. Operate riding mower
11. Operate weed eater
12. Recoil starters
13. Sharpen chain
14. Bring proper clothing
15. Mixing of fuels
16. Riding lawnmower obstacle
17. Demonstration
18. Rewriting electrical motor
19. Replacing belts
20. Clean air filters

COURSE: Nursery and Landscape Management

UNIT TITLE: Pesticide Use and Safety

UNIT GOAL: The student will be able to properly use pesticides.

UNIT PERFORMANCE OBJECTIVES:

Upon completion of this instructional unit, the student will be able to:

1. Demonstrate proper steps in mixing pesticides safely.
2. Properly demonstrate the necessary skills needed in determining amounts of pesticide to apply.
3. Be able to read and follow instructions on pesticide labels.
4. Determine the type of pest injury and the proper pesticide to use.
5. Identify phamphlets from extension which would be helpful in handling pesticides.

INSTRUCTOR'S NAME: Dennis Benson

TEACHING OUTLINE

I. Introduction to pesticides (Identify terms)
   - A. Herbicide
   - B. Fumigant
   - C. Insecticide
   - D. Rodenticide
   - E. Algacide

II. Read pesticide label (Isotox, Funginex, Weed-B-Gone)
   - A. List pest chemicals they will control
   - B. What crops can be treated

III. Pesticide application
   - A. Protective equipment
   - B. Checking equipment
   - C. Weather conditions
   - D. Proper disposal
   - E. State and Federal Regulations

IV. Where to find information
   - A. Extension
   - B. Nursery
   - C. State
   - D. Federal

LEARNING ACTIVITIES

1. Collect magazine advertisements featuring the different types of pesticides.

2. Match the tree or shrub injury to the proper pesticide control.

3. Use student Exercise 7-F, Reading Pesticide Labels from the Nursery and Landscape Activity Packet.

4. Use food coloring in place of chemical to demonstrate proper safety and label recommendations (Hands on activity).

5. Develop a worksheet of various math problems. Ex. 100 tree apple orchard - How much spray do I need and at what rate?

6. Have students contact ISU Extension and get appropriate pamphlets.

7. Show films (Modern Talking Picture Service Guide - The Insect Challenge - 28 minutes)

COURSE: Nursery and Landscape Management

UNIT TITLE: Retail Horticulture Skills, Sales, and Attitudes

UNIT GOAL: To prepare students with knowledge of business skills and to identify personal qualities which enable him/her to effectively represent the business and complete successful business transactions.

UNIT PERFORMANCE OBJECTIVES:

Upon completion of this instructional unit, the student will be able to:

1. Describe the importance of good selling.
2. Describe the traits of a successful salesperson.
3. Properly carry out a sales transaction from approaching the customer to closing the sale.
4. Demonstrate the ability to obtain information about a product and use this knowledge to improve selling habits.
5. Develop a sales personality and complete self analysis of interest survey in sales work.
6. Develop a list of skills that could be helpful in working in a garden center or within the horticulture industry.

INSTRUCTOR'S NAME: Barb Hansen

TEACHING OUTLINE

I. Principles of good selling
   A. Define "good selling."
   B. How to serve the needs of the customer.

II. Salesmanship service in Garden Centers
   A. Personality traits
      1. Honesty
      2. Loyalty
      3. Etc.
   B. Training, Experience and Study
      1. How the employer might train an employee
      2. Experience some training from businesses

III. Personality traits can be developed
   A. Interest in selling
   B. Self analysis survey

IV. Product knowledge
   A. Knowledge of merchandise and stock
   B. Suggestions on use and application of products or services
   C. Explanation or demonstrations of products

V. The sales transaction
   A. Parts of sales transaction
      1. Use of cash register or calculator and making change
      2. Using a sales receipt
   B. Approaching the customer
      1. How to greet the customer
   C. Securing customer attention, interest and desire
      1. Attract customer attention
      2. Stimulate customer interest in the product
      3. Create a desire to buy
   D. Handling objectives
      1. Price
      2. Quality
      3. Unknown product
      4. Service
   E. Closing a sale
      1. Be prepared to write a sales ticket
      2. Be prepared to answer final questions
      3. Sell the product or lose the sale

VI. Other skills in working at a Garden Center
   A. Transplanting, fertilizing, watering (care of plants)
   B. How to organize yourself in the business
      1. Knowledge of the particular business

VII. General attitude and work ethic
   A. Enthusiasm for the tasks at hand
   B. Complete task asked to do

ACTIVITIES

1. Select one of the following places of business and make the following observations: (a) Garden Center, (b) Grocery Store, (c) Mechanic Shop, (d) Service Station.

   A. Does the business have a good selling policy?
   B. Identify those employees that do a better job than others and why.
   C. List the practices that you experienced that would classify as "good" selling or as "poor" selling.

2. Define the following words as they apply to selling, loyalty, honesty, resourcefulness, imagination, courage, courtesy, interest, self-confidence, ambition, industry, adaptability, observation, and tact.

   Ask questions: Can these personality traits be developed in a person? If you don't have them now, are you out of luck?

3. Find a self-analysis of interest in saleswork survey and have students complete.

4. Have students use an adding machine (calculator), cash register (if available), make out a sales ticket with information, and make change to another student or instructor.

5. Have students sell a product from approach to customer through the closing of the sale.

6. Roll playing customer/salesperson. Make out customer complaint and question cards for students to roll play back and forth.

7. Have students make out what a salesperson should know about the products they handle in a Garden Cener.

8. Indicate some related items that might be suggested to the person who has come into the store to purchase the following:

   a. Garden Seeds
   b. Paint
   c. Fly spray
   d. Garden hose
   e. Rolls of fence
   f. Shrubbery plants
   g. Weed Killers
   h. A flat of flowering annuals
   i. Lawn fertilizer and seeds
   j. Potted house plants

9. Brainstorm on traits of a good salesperson and how an employee can achieve these traits if they don't already have them.

10. Interview Garden Center, Nursery Worker (etc.), about their job or what the employer looks for in a worker. **ALTERNATIVE:** Ask a guest speaker in class to talk on what it takes to get a job in the horticulture area.

COURSE: Nursery and Landscape Management

UNIT TITLE: Establishing Wildlife Habitats

UNIT GOAL: Develop an interest in and appreciation for Wildlife Management

UNIT PERFORMANCE OBJECTIVES:

Upon completion of this instructional unit, the student will be able to:

1. Explain the need for wildife management.
2. Identify 3 major wildlife habitats and their type of vegetation.
3. Plan and maintain a small wildlife habitat.
4. Explain laws pertaining to wildlife management.
5. Identify and explain jobs available in wildlife managment.
6. Identify things that can be done to improve wildlife habitats.

INSTRUCTOR'S NAME: Brian Huinker

TEACHING OUTLINE

A. Develop an appreciation for wildlife management
   1. Origin and need for wildlife management
   2. Location and function of area conservation projects
B. Types of wildlife habitats
   1. Woodlands
   2. Wetlands
   3. Prairies
C. Plant identification
   1. Trees
   2. Shrubs
   3. Grasses
D. Plant selection
   1. Selecting for habitats
   2. Selecting for climate
   3. Selecting for wildlife
E. Planning a wildlife habitat
   1. Laws and regulations
   2. Site selection
   3. Developing a landscape plan
F. Establishing a wildlife habitat
   1. Establishing grasses
   2. Establishing trees and shrubs
   3. Managing wildlife
G. Caring for established areas
   1. Pests and preditor problems
   2. Stocking wildlife
H. Job opportunities
   1. The role of a conservation officer
   2. The role of a game warden
   3. Other related jobs
I. Improving wildlife habitats in your area
   1. Area considerations
   2. Home considerations
   3. Local and national organizations

LEARNING ACTIVITIES

A. Tours to educate and develop appreciation
   1. State Park
   2. State Game Reserves
   3. State Tree Nurseries
   4. Hatcheries
   5. Home Developed Plots
   6. Plant Identification
   7. Wildlife Identification
   8. Habitat Development

B. Guest Speakers - Inclass or on trips
   1. Conservation Officers
   2. Game Wardens
   3. Individuals with Habitats
   4. Conservation Groups
   5. Others - Landscape Specialist, Student Employees, etc.
   6. Write to State Agencies - Not just home states

C. Develop Wildlife Habitat
   1. Develop area for school use
   2. Develop "Backyard" plan
   3. Interview people (Guest Speakers)
   4. Selection of area and landscape plans
   5. Seeding grass and planting trees and shrubs
   6. Hand-on caring and maintenance